System x3550 M5

IBM Redbooks Product Guide

Designed in a compact, versatile 1U two-socket rack server, the System x3550 M5 rack server fuels almost any workload from infrastructure to high-performance computing (HPC) to cloud or big data with leadership security, efficiency, and reliability. Integrated with up to two Intel Xeon processors of the E5-2600 v3 product family with faster, energy-efficient TruDDR4 Memory, the x3550 M5 delivers exceptional performance. Storage can include up to 12 drives in an impressive selection of sizes and types.

Suggested use: Database, virtualization and cloud computing, infrastructure security, systems management, enterprise applications, collaboration/email, streaming media, web, and HPC.

The following figure shows the System x3550 M5.

Figure 1. The System x3550 M5

Did you know?

The x3550 M5 incorporates energy smart features for minimized costs and efficient performance. Dual fan zones support operation in up to 40°C environments. 80 PLUS Titanium power supply units (PSUs) can deliver 96% efficiency at 50% load.

The x3550 M5 has outstanding memory performance that is achieved by supporting two-RDIMM-per-channel configurations at speeds up to 12% faster than the Intel specification, while still maintaining world-class reliability.

System x® servers achieved the highest reliability of any x86 servers (ITIC 2014-2015 Global Server Hardware, Server OS Reliability Survey: http://public.dhe.ibm.com/common/ssi/ecm/en/xsl03126usen/XSL03126USEN.PDF).

The x3550 M5 integrates leadership security and reliability. System x Trusted Platform Assurance, an exclusive set of System x features and practices, establishes a foolproof security foundation for your workloads. Enterprise-class data protection is provided with optional self-encrypting drives and simple, centralized key management through IBM Security Key Lifecycle Management. Diagnostic tools facilitate reduced downtime and costs.

Key features

The System x3550 M5 is a cost- and density-balanced 1U, 2-socket business-critical server, offering improved performance and pay-as-you grow flexibility along with new features that improve server management capability. New, innovative, energy-smart design with powerful high-performance processors, a large capacity of high-performing DDR4 memory, and an improved feature set are ideal for business-critical applications and cloud deployments.

Combining balanced performance and flexibility, the x3550 M5 is a great choice for small and medium businesses and up to the large enterprise. It can provide outstanding uptime to keep business-critical applications and cloud deployments running safely. Ease-of-use and comprehensive systems management tools make it easy to deploy. Outstanding reliability, availability, and serviceability (RAS) and high-efficiency design improve your business environment and help save operational costs.

Scalability and performance

The x3550 M5 offers numerous features to boost performance, improve scalability, and reduce costs:

- Improves productivity by offering superior system performance with up to 18-core processors, up to 45 MB of L3 cache, and up to 9.6 GT/s QPI interconnect links.

- Supports up to two processors, 36 cores, and 72 threads to maximize the concurrent execution of multithreaded applications.

- Intelligent and adaptive system performance with energy efficient Intel Turbo Boost Technology allows CPU cores to run at maximum speeds during peak workloads by temporarily going beyond processor TDP.

- Intel Hyper-Threading Technology boosts performance for multithreaded applications by enabling simultaneous multithreading within each processor core, up to two threads per core.

- Intel Virtualization Technology integrates hardware-level virtualization hooks that allow operating system vendors to better utilize the hardware for virtualization workloads.

- Intel Advanced Vector Extensions 2.0 (AVX 2.0) enable acceleration of enterprise-class workloads, such as databases, enterprise resource planning, and others.

- Up to 2133 MHz memory speeds with two DIMMs per channel running at 2133 MHz to help maximize system performance.

- Up to 1.5 TB of memory capacity with 64 GB Load Reduced DIMMS (LRDIMMs) (support for 64 GB LRDIMMs is planned for a later date).

- 12 Gbps serial-attached SCSI (SAS) internal storage connectivity doubles the data transfer rate compared to 6 Gb SAS solutions to maximize performance of storage I/O-intensive applications.

- Flexible and scalable internal storage configurations for up to 24 TB of storage capacity in a dense 1U rack form factor.

- The use of solid-state drives (SSDs) instead of or along with traditional spinning hard disk drives (HDDs) can significantly improve I/O performance. An SSD can support up to 100 times more I/O operations per second (IOPS) than a typical HDD.

- The server has four integrated Gigabit Ethernet ports and optional 10 Gb Ethernet ports with mezzanine LOM (ML2) adapters.

- The server offers up to four PCI Express (PCIe) 3.0 I/O expansion slots in a dense 1U rack form factor.

- With Intel Integrated I/O Technology, the PCI Express 3.0 controller is integrated into the Intel Xeon processor E5 family. This helps to dramatically reduce I/O latency and increase overall system performance.

Availability and serviceability

The x3550 M5 provides many features to simplify serviceability and increase system uptime:

- Tool-less cover removal provides easy access to upgrades and serviceable parts, such as processors, memory DIMMs, and adapter cards.

- The server offers hot-swap drives supporting RAID redundancy for data protection and greater system uptime.

- The server offers redundant hot-swap power supplies and hot-swap redundant fans to provide availability for business-critical applications.

- The new next-gen light path diagnostics LCD display panel simplifies servicing, speeds up problem resolution, and helps improve system availability.

- Predictive Failure Analysis (PFA) detects when system components (processors, VRMs, memory, disks, fans, and power supplies) operate outside standard thresholds and generates proactive alerts in advance of possible failure, therefore increasing uptime.

- SSDs offer significantly better reliability than traditional mechanical HDDs for greater uptime.

- Built-in Integrated Management Module II (IMM2) continuously monitors system parameters, triggers alerts, and performs recovery actions in case of failure, to minimize downtime.

- Built-in diagnostics using Dynamic Systems Analysis (DSA) Preboot speed up troubleshooting tasks to reduce service time.

- Three-year customer replaceable unit and onsite limited warranty, next business day 9x5. Optional service upgrades available.

Manageability and security

Powerful systems management features simplify local and remote management of the x3550 M5 and deliver enterprise-class data protection:

- The server includes an Integrated Management Module II (IMM2) to monitor server availability and perform remote management.

- An integrated industry-standard Unified Extensible Firmware Interface (UEFI) enables improved setup, configuration, and updates, and simplifies error handling.

- IBM Systems Director offers comprehensive systems management tools to help increase uptime, reduce costs, and improve productivity through advanced server management capabilities.

- Two integrated Trusted Platform Modules (TPMs) support the enablement of advanced cryptographic functionality, such as digital signatures and remote attestation.

- System x Trusted Platform Assurance, an exclusive set of System x security features and practices, establishes a foolproof security foundation for workloads by delivering firmware that is securely built, tested, digitally signed, and verified prior to execution.

- The server offers enterprise-class data protection with optional self-encrypting drives and simple, centralized key management through IBM Security Key Lifecycle Management.

- There is industry-standard AES NI support for faster, stronger encryption.

- Intel Execute Disable Bit functionality can help prevent certain classes of malicious buffer overflow attacks when combined with a supporting operating system.

- Intel Trusted Execution Technology provides enhanced security through hardware-based resistance to malicious software attacks, allowing an application to run in its own isolated space protected from all other software running on a system.

Energy efficiency

The x3550 M5 offers the following energy-efficiency features to save energy, reduce operational costs, increase energy availability, and contribute to a green environment:

- Energy-efficient planar components help lower operational costs.

- High-efficiency power supplies with 80 PLUS Platinum and Titanium certifications.

- Intel Intelligent Power Capability powers individual processor elements on and off as needed, to reduce power draw.

- Low-voltage Intel Xeon processors draw less energy to satisfy the demands of power and thermally constrained data centers and telecommunication environments.

- Low-voltage 1.2 V DDR4 memory DIMMs consume up to 20% less energy compared to 1.35 V DDR3 DIMMs.

- The server uses hexagonal ventilation holes, a part of Calibrated Vectored Cooling™ technology. Hexagonal holes can be grouped more densely than round holes, providing more efficient airflow through the system.

- IBM Systems Director Active Energy Manager™ and Intel Node Manager provide advanced data center power notification and management to help achieve lower heat output and reduced cooling needs.

Locations of key components and connectors

The following figure shows the front of the server.
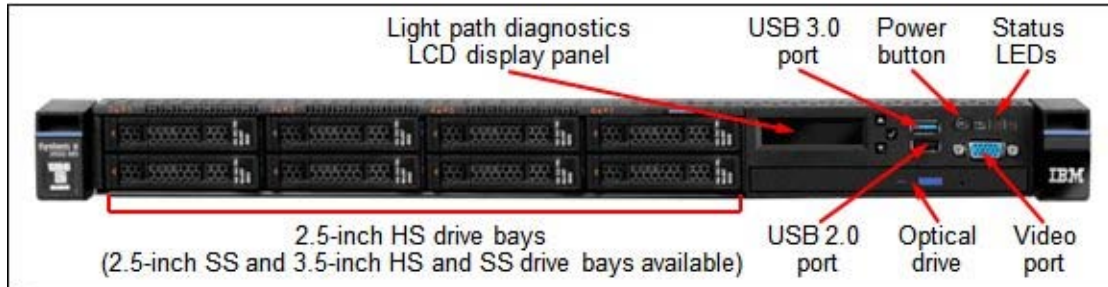

Figure 2. Front view of the System x3550 M5

The following figure shows the rear of the x3550 M5 server with three PCIe low profile slots.
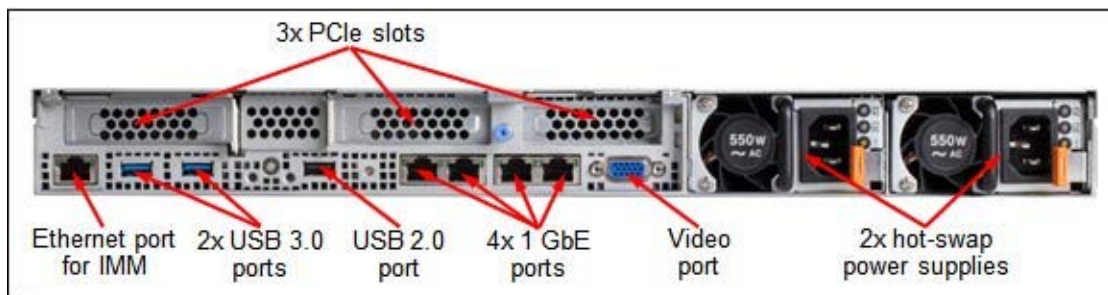

Figure 3. Rear view of the System x3550 M5

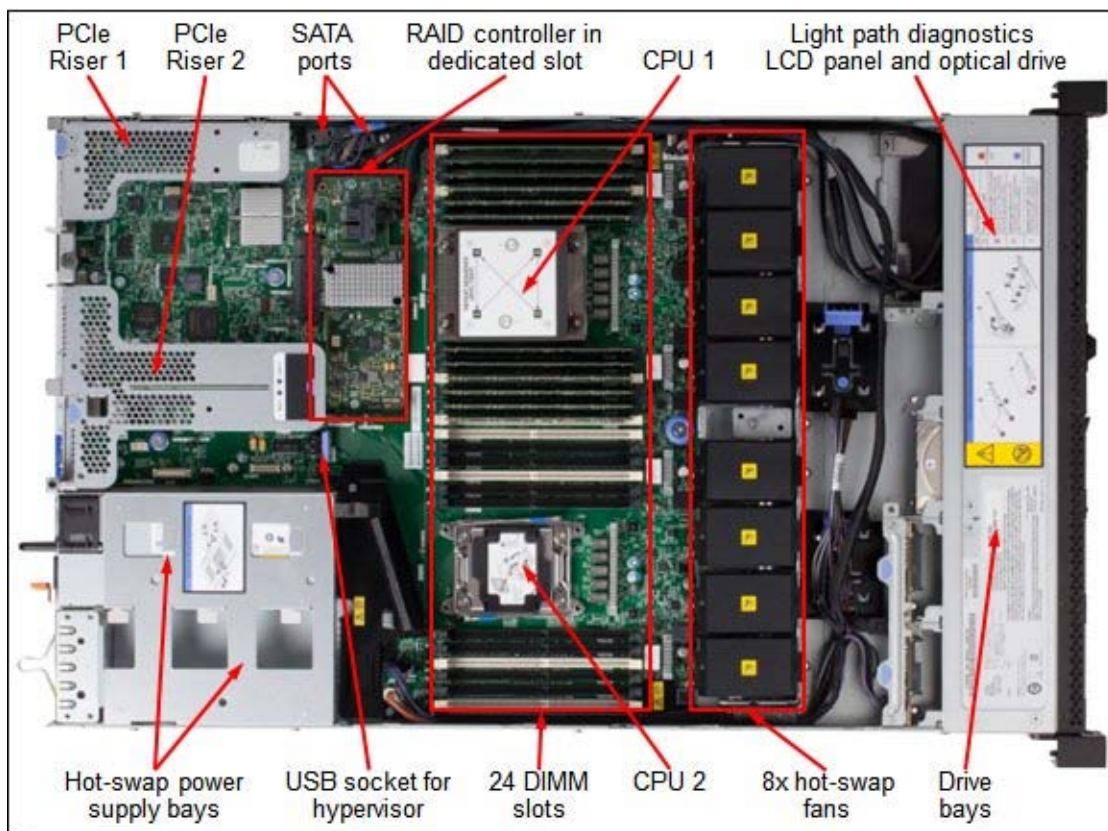The following figure shows the locations of key components inside the server.

Figure 4. Inside view of the System x3550 M5

Standard specifications

The following table lists the standard specifications.

Table 1. Standard specifications (part 1)

Components	Specification
Form factor	1U Rack.
Processor	Up to two Intel Xeon processor E5-2600 v3 product family CPUs with 18 or 16 cores (2.3 GHz core speeds); or 14, 12, or 10 cores (up to 2.6 GHz core speeds); or 8 cores (up to 3.2 GHz core speeds); or 6 cores (up to 3.4 GHz core speeds); or 4 cores (up to 3.5 GHz core speeds). Two QPI links up to 9.6 GT/s each. Up to 2133 MHz memory speed. Up to 45 MB L3 cache.
Chipset	Intel C612.
Memory	Up to 24 DIMM sockets (12 DIMMs per processor). RDIMMs and LRDIMMs (Load Reduced DIMMs) are supported.. Memory types cannot be intermixed. Memory speed up to 2133 MHz.
Memory maximums	- With RDIMMs: Up to 384 GB with 24x 16 GB RDIMMs and two processors - With LRDIMMs: Up to 1.5 TB with 24x 64 GB LRDIMMs and two processors (support for 64 GB LRDIMMs is planned for a later date)
Memory protection	Error correction code (ECC), Chipkill (for x4-based memory DIMMs).
Disk drive bays	Up to 12x 2.5" hot-swap SAS/SATA HDDs, or up to 8x 2.5" Simple Swap SATA HDDs, or up to 4x 3.5" hot-swap SAS/SATA HDDs, or up to 4x 3.5" Simple Swap SATA HDDs.
Maximum internal storage	Up to 21.6 TB with 1.8 TB 2.5" SAS HDDs, or up to 12 TB with 1 TB 2.5" NL SAS/SATA HDDs, or up to 19.2 TB with 1.6 TB 2.5" SAS SSDs, or up to 24 TB with 6 TB 3.5" NL SAS/SATA HDDs. Intermix of SAS/SATA is supported.
Storage controller	- Onboard 6 Gb SATA: no RAID support 12 Gb SAS/SATA RAID: RAID 0, 1, 10 with M1215 or M5210. Optional upgrade to RAID 5, 50 is available for M1215. Optional upgrade to RAID 5, 50 is available for M5210 (zero-cache; 1 GB non-backed cache; 1 GB, 2 GB, or 4 GB flash-backed cache). Optional upgrade to RAID 6, 60 is available for M5210 with memory cache upgrades. Optional SSD Caching and Performance Accelerator feature upgrades are available. 12 Gb SAS/SATA non-RAID: N2215 HBA
Optical drive bays	One, optional, for models with 4 or 8 drive bays (models with 10 drive bays do not support an internal optical drive). Support for DVD-ROM or Multiburner.
Tape drive bays	None.
Network interfaces	Four integrated RJ-45 Gigabit Ethernet 1000BASE-T ports (BCM5719); optional Mezzanine LOM (ML2) slot for dual-port 10 GbE cards with SFP+ or RJ-45 connectors or quad-port GbE cards with RJ-45 connectors.
PCI Expansion slots	Up to four slots, depending on the riser cards installed. The slots are as follows: - Slot 1: PCIe 3.0 x16 or ML2; low profile, half-length (not present if the HDD Rear Kit is installed) - Slot 2: PCIe 3.0 x16 or PCIe 3.0 x8; low profile or full-height, half-length (PCIe 3.0 x16 slot requires the second processor to be installed) (not present if the HDD Rear Kit is installed) - Slot 3: PCIe 3.0 x16 or PCIe 3.0 x8; low profile, half-length - Slot 4: PCIe 3.0 x8 (dedicated for an internal RAID controller)

Table 1. Standard specifications (part 2)

Components	Specification
Ports	- Front: 1x USB 3.0, 1x USB 2.0 (8x 2.5" drive bay models) or 2x USB 2.0 (4x 3.5" and 10x 2.5" drive bay models), and 1x DB-15 video. - Rear: 2x USB 3.0, 1x USB 2.0, 1x DB-15 video, 1x RJ-45 systems management, 4x RJ-45 GbE network ports. Optional 1x DB-9 serial port. - Internal: 1x USB port (for embedded hypervisor).
Cooling	Calibrated Vectored Cooling with up to eight redundant hot-swap fans (six standard, additional two with the second processor or with the x3550 M5 Thermal Solution Kit); dual fan zones with N+1 fan redundancy; each fan has two motors.
Power supply	Up to two redundant hot-swap 550 W, 750 W, or 900 W High Efficiency Platinum AC power supplies, or 750 W High Efficiency Titanium AC power supplies.
Hot-swap parts	Hard drives, power supplies, and fans.
Systems management	Unified Extensible Firmware Interface (UEFI), Integrated Management Module II (IMM2.1) based on Renesas SH7758, Predictive Failure Analysis, light path diagnostics, Automatic Server Restart, ToolsCenter, IBM Systems Director and Active Energy Manager, and Intel Node Manager. Optional Advanced Management Module Advanced Upgrade for remote presence (graphics, keyboard and mouse, virtual media).
Security features	Power-on password, administrator's password, two Trusted Platform Modules (TPMs): on the IMM2 (TPM 1.2) and on the host (TPM 1.2/2.0). Optional lockable front bezel.
Video	Matrox G200eR2 with 16 MB memory integrated into the IMM2. Maximum resolution is 1600x1200 at 75 Hz with 16 M colors.
Operating systems supported	Microsoft Windows Server 2012 R2, 2012, and 2008 R2, Red Hat Enterprise Linux 6 and 7, SUSE Linux Enterprise Server 11, VMware vSphere (ESXi) 5.1 and 5.5.
Limited warranty	Three-year customer-replaceable unit and onsite limited warranty with 9x5/Next Business Day (NBD).
Service and support	Optional service upgrades are available through the ServicePac®: 4-hour or 2-hour response time, 8 hours fix time, one-year or two-year warranty extension, remote technical support for System x hardware and selected System x and third-party (Microsoft, Linux, VMware) software.
Dimensions	Height: 43 mm (1.7 in), width: 429 mm (16.9 in), depth: 734 mm (28.9 in)
Weight	Minimum configuration: 13.8 kg (30.5 lb), maximum: 19.3 kg (42.7 lb)

The x3550 M5 servers are shipped with the following items:

- Statement of Limited Warranty
- Important Notices
- Rack Installation Instructions
- Documentation CD containing *Installation and User's Guide*
- System x3550 M5 Slide Kit G4
- 2.8 m C13-C14 power cord (one for models with one power supply and two for models with two power supplies)

Note: Cable Management Arm (CMA) is not included. See the "Rack options" section for ordering information.

Standard models

The following table lists the standard models of the x3550 M5.

Table 2. Standard models

MTM*	Intel Xeon processor† (2 maximum)	Memory (RDIMMs)	RAID	Drive bays	Drives	Onboard NIC	I/O slots (std / max)	Optical drive	Power supply (std / max)
Models announced September 2014									
5463-A2x	1x E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M1215	4x 2.5" SS / 8	Open bay	4x GbE	2 / 4	Optional	1x 550 W HS / 2
5463-B2x	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M1215	4x 3.5" SS / 4	Open bay	4x GbE	2 / 4	Optional	1x 550 W HS / 2
5463-C2x	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16GB 2133MHz§	M1215	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Optional	1x 550 W HS / 2
5463-C4x	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16GB 2133MHz§	M1215	4x 3.5" HS / 4	Open bay	4x GbE	2 / 4	Optional	1x 550 W HS / 2
5463-D2x	1x E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	1x 16GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Optional	1x 550 W HS / 2
5463-H2x	1x E5-2630L v3 8C 1.8GHz 20MB 1866MHz 55W	1x 16GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Optional	1x 550 W HS / 2
5463-F2x	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	1x 16GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Optional	1x 550 W HS / 2
5463-G2x	1x E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	1x 16GB 2133MHz	M5210 1GB Flash	10x 2.5" HS / 12	Open bay	4x GbE	2 / 4	None	1x 550 W HS / 2
5463-62x	1x E5-2670 v3 12C 2.3GHz 30MB 2133MHz 120W	1x 16GB 2133MHz	M5210 2GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Optional	1x 750 W HS / 2
5463-J2x	1x E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	1x 16GB 2133MHz	M5210 2GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Optional	1x 750 W HS / 2
5463-L2x	1x E5-2690 v3 12C 2.6GHz 30MB 2133MHz 135W	1x 16GB 2133MHz	M5210	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Optional	1x 750 W HS / 2
5463-M2x	1x E5-2699 v3 18C 2.3GHz 45MB 2133MHz 145W	1x 16GB 2133MHz	M5210	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Optional	1x 900 W HS / 2

* x in the Machine Type Model (MTM) represents a country-specific letter (for example, the EMEA MTM is 5463-A2G, and the US MTM is 5463-A2U). Ask a Lenovo representative for specifics.
† Processor detail: Processor quantity and model, cores, core speed, L3 cache, memory speed, and thermal design power (TDP).
§ For these models, the standard DIMM is rated at 2133 MHz, but operates at a lower speed to match the processor memory speed. Actual memory speed maximums depend on several factors, as described in "Memory options".

Refer to the Specifications section for information about standard features of the server.

Express models

The following table lists the express models of the x3550 M5.

Table 3. Express models (Part 1: United States, Canada, Latin America)

MTM	Intel Xeon processor† (2 maximum)	Memory (RDIMMs)	RAID	Drive bays	Drives	Onboard NIC	I/O slots (std / max)	Optical drive	Power supply (std / max)
United States, Canada									
5463-EAU	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M1215	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Multi burner	1x 550 W HS / 2
5463-EBU	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 16GB 2133MHz§	M5210	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Multi burner	1x 550 W HS / 2
5463-EEU	2x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	2x 16GB 2133MHz§	M5210 2GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Multi burner	2x 550 W HS / 2
5463-ECU	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	1x 16GB 2133MHz§	M5210	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Multi burner	1x 550 W HS / 2
5463-EDU	1x E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	1x 16GB 2133MHz	M5210	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Multi burner	1x 750 W HS / 2
5463-EFU	2x E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	4x 16GB 2133MHz	M5210 4GB Flash	8x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Multi burner	2x 550 W HS / 2
Latin America									
5463-EMU	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M1215	4x 3.5" SS / 4	Open bay	4x GbE	4 / 4	Multi burner	1x 550 W HS / 2
5463-ENU	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	2x 300GB 10K	4x GbE	4 / 4	Multi burner	2x 550 W HS / 2
5463-ERU	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M1215	4x 2.5" SS / 8	Open bay	4x GbE	4 / 4	Multi burner	1x 550 W HS / 2
5463-ESU	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 8GB 2133MHz§	M5210 1GB Flash	4x 2.5" SS / 8	Open bay	4x GbE	4 / 4	Multi burner	2x 550 W HS / 2
5463-EOU	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 8GB 2133MHz§	M5210 1GB Flash	4x 3.5" SS / 4	Open bay	4x GbE	4 / 4	Multi burner	2x 550 W HS / 2
5463-EPU	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	2x 16GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	4 / 4	Multi burner	2x 550 W HS / 2
5463-EQU	2x E5-2680 v3 12C 2.5GHz 30MB 2133MHz 120W	2x 16GB 2133MHz	M5210 2GB Flash	8x 2.5" HS / 8	Open bay	4x GbE	4 / 4	Multi burner	2x 750 W HS / 2

† Processor detail: Processor quantity and model, cores, core speed, L3 cache, memory speed, TDP.
§ For these models, the standard DIMM is rated at 2133 MHz, but operates at a lower speed to match the processor memory speed. Actual memory speed maximums depend on several factors, as described in "Memory options".

Table 3. Express models (Part 2: Asia Pacific, Japan, Europe, Middle East and Africa)

MTM	Intel Xeon processor† (2 maximum)	Memory (RDIMMs)	RAID	Drive bays	Drives	Onboard NIC	I/O slots (std / max)	Optical drive	Power supply (std / max)
Asia Pacific (Australia and New Zealand only)									
5463-EGM	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M1215	4x 3.5" SS / 4	Open bay	4x GbE	4 / 4	Multi burner	1x 550 W HS / 2
5463-EHM	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	2x 300GB 10K	4x GbE	4 / 4	Multi burner	1x 550 W HS / 2
5463-EIM	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	2x 8GB 2133MHz§	M1215	4x 3.5" SS / 4	Open bay	4x GbE	4 / 4	Multi burner	1x 550 W HS / 2
5463-EJM	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	2x 8GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	2x 300GB 10K	4x GbE	4 / 4	Multi burner	1x 750 W HS / 2
5463-EKM	1x E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	2x 8GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	4 / 4	Multi burner	1x 750 W HS / 2
5463-ELM	2x E5-2650 v3 10C 2.3GHz 25MB 2133MHz 105W	2x 16GB 2133MHz	M5210	8x 2.5" HS / 8	Open bay	4x GbE	4 / 4	Multi burner	2x 750 W HS / 2
Japan									
5463-E5J	1x E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	4 / 4	Optional	1x 550 W HS / 2
5463-E6J	1x E5-2609 v3 6C 1.9GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	4 / 4	Optional	1x 550 W HS / 2
5463-E7J	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 8GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	4 / 4	Optional	1x 550 W HS / 2
Europe, Middle East and Africa									
5463-E1G	1x E5-2603 v3 6C 1.6GHz 15MB 1600MHz 85W	1x 8GB 2133MHz§	M1215	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Multi burner	1x 550 W HS / 2
5463-E2G	1x E5-2620 v3 6C 2.4GHz 15MB 1866MHz 85W	1x 8GB 2133MHz§	M5210 1GB Flash	8x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Multi burner	1x 550 W HS / 2
5463-E3G	1x E5-2630 v3 8C 2.4GHz 20MB 1866MHz 85W	1x 8GB 2133MHz§	M5210 1GB Flash	4x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Multi burner	2x 550 W HS / 2
5463-E4G	1x E5-2640 v3 8C 2.6GHz 20MB 1866MHz 90W	1x 16GB 2133MHz§	M5210 1GB Flash	8x 2.5" HS / 8	Open bay	4x GbE	2 / 4	Multi burner	1x 550 W HS / 2

† Processor detail: Processor quantity and model, cores, core speed, L3 cache, memory speed, TDP.
§ For these models, the standard DIMM is rated at 2133 MHz, but operates at a lower speed to match the processor memory speed. Actual memory speed maximums depend on several factors, as described in "Memory options".

Refer to the Specifications section for information about standard features of the server.

Processor options

The x3550 M5 supports the processor options listed in the following table. The server supports up to two processors. This table shows which server models have each processor standard. If there is no corresponding *where used* model for a particular processor, this processor is only available through Configure-to-order (CTO). The processor part numbers include a CPU, a heatsink, and two system fans.

Table 4. Processor options

Part number	Feature codes*	Description	Standard models where used
00KA070	A5BF / A5BV	Intel Xeon Processor E5-2603 v3 6C 1.6GHz 15MB Cache 1600MHz 85W	A2x
00KA071	A5BG / A5BW	Intel Xeon Processor E5-2609 v3 6C 1.9GHz 15MB Cache 1600MHz 85W	B2x
00KA067	A5BC / A5BS	Intel Xeon Processor E5-2620 v3 6C 2.4GHz 15MB Cache 1866MHz 85W	C2x, C4x
00MU407	ASCT / ASD4	Intel Xeon Processor E5-2623 v3 4C 3.0GHz 10MB Cache 1866MHz 105W	-
00KA068	A5BD / A5BT	Intel Xeon Processor E5-2630 v3 8C 2.4GHz 20MB Cache 1866MHz 85W	D2x
00KA077	A5BN / A5C2	Intel Xeon Processor E5-2630L v3 8C 1.8GHz 20MB Cache 1866MHz 55W	H2x
00MU408	ASCU / ASD5	Intel Xeon Processor E5-2637 v3 4C 3.5GHz 15MB Cache 2133MHz 135W	-
00KA069	A5BE / A5BU	Intel Xeon Processor E5-2640 v3 8C 2.6GHz 20MB Cache 1866MHz 90W	F2x
00MU409	ASCV / ASD6	Intel Xeon Processor E5-2643 v3 6C 3.4GHz 20MB Cache 2133MHz 135W	-
00KA072	A5BH / A5BX	Intel Xeon Processor E5-2650 v3 10C 2.3GHz 25MB Cache 2133MHz 105W	G2x
00MU406	ASCS / ASD3	Intel Xeon Processor E5-2650L v3 12C 1.8GHz 30MB Cache 2133MHz 65W	-
00MU400	ASCL / ASCX	Intel Xeon Processor E5-2660 v3 10C 2.6GHz 25MB Cache 2133MHz 105W	-
00MU410	ASCW / ASD7	Intel Xeon Processor E5-2667 v3 8C 3.2GHz 20MB Cache 2133MHz 135W	-
00KA074	A5BK / A5BZ	Intel Xeon Processor E5-2670 v3 12C 2.3GHz 30MB Cache 2133MHz 120W	62x
00KA075	A5BL / A5C0	Intel Xeon Processor E5-2680 v3 12C 2.5GHz 30MB Cache 2133MHz 120W	J2x
00MU401	ASCM / ASCY	Intel Xeon Processor E5-2683 v3 14C 2.0GHz 35MB Cache 2133MHz 120W	-
00MU402	ASCN / ASCZ	Intel Xeon Processor E5-2685 v3 12C 2.6GHz 30MB Cache 2133MHz 120W	-
00KA076	A5BM / A5C1	Intel Xeon Processor E5-2690 v3 12C 2.6GHz 30MB Cache 2133MHz 135W	L2x
00MU403	ASCP / ASD0	Intel Xeon Processor E5-2695 v3 14C 2.3GHz 35MB Cache 2133MHz 120W	-
00MU404	ASCQ / ASD1	Intel Xeon Processor E5-2697 v3 14C 2.6GHz 35MB Cache 2133MHz 145W	-
00MU405	ASCR / ASD2	Intel Xeon Processor E5-2698 v3 16C 2.3GHz 40MB Cache 2133MHz 135W	-
00KF584	ARZ8 / ARZ9	Intel Xeon Processor E5-2699 v3 18C 2.3GHz 45MB Cache 2133MHz 145W	M2x

* The first feature code is for the first processor; the second feature code is for the second processor.

Memory options

System x3550 M5 supports TruDDR4 Memory. TruDDR Memory uses the highest-quality components sourced from Tier 1 DRAM suppliers and only memory that meets our strict requirements is selected. It is compatibility tested and tuned on every System x server to maximize performance and reliability. TruDDR4 Memory will have a unique signature programmed into the DIMM, which will enable System x servers to verify whether the memory installed is qualified/supported. Because TruDDR4 Memory is authenticated, certain extended memory performance features can be enabled to extend performance over industry standards. From a service and support standpoint, System x memory automatically assumes the system's warranty, and service and support provided worldwide.

The server supports up to 12 DIMMs when one processor is installed and up to 24 DIMMs when two processors are installed. Each processor has four memory channels, and there are three DIMMs per channel.

The following rules apply when selecting the memory configuration:

- The server supports RDIMMs and LRDIMMs.
- Mixing different types of memory (RDIMMs and LRDIMMs) is not supported.
- The maximum quantity of DIMMs that can be installed in the server depends on the number of processors.
- All DIMMs in the server operate at the same speed, which is determined as the lowest value of the following speeds:
  - Memory speed that is supported by the specific processor.
  - Lowest of maximum operating speeds for selected memory configuration that depends on quantity of DIMMs per channel, as shown under "Maximum operating speed" in Table 5.

The following memory protection technologies are supported:

- ECC
- Chipkill (for x4-based memory DIMMs)

Chipkill works only in independent channel mode (the default is operational mode) and supports only x4-based memory DIMMs.

The following table shows the characteristics of the supported DIMMs. Table cells highlighted with a gray background indicate when the number of DIMMs per channel still allows the DIMMs to operate at a rated speed.

Table 5. Maximum memory speeds

DIMM specification	RDIMM			LRDIMM
Rank	Single rank	Dual rank		Quad rank
Part numbers	46W0784 (4 GB) 46W0788 (8 GB)	46W0792 (8 GB)	46W0796 (16 GB)	46W0800 (32 GB) 95Y4812 (64 GB)*
Rated speed	2133 MHz	2133 MHz	2133 MHz	2133 MHz
Rated voltage	1.2 V	1.2 V	1.2 V	1.2 V
Maximum quantity supported**	24	24	24	24
Maximum DIMM capacity	8 GB	8 GB	16 GB	64 GB
Maximum memory capacity	192 GB	192 GB	384 GB	1.5 TB
Maximum memory at rated speed	128 GB	128 GB	256 GB	512 GB
Maximum operating speed				
1 DIMM per channel	2133 MHz	2133 MHz	2133 MHz	2133 MHz
2 DIMMs per channel	2133 MHz	2133 MHz	2133 MHz	2133 MHz
3 DIMMs per channel	1600 MHz	1600 MHz	1866 MHz	1866 MHz

* Support for 64 GB LRDIMMs is planned for a later date.
** The maximum quantity that is supported is shown for two processors installed.

The following table lists memory options available for the x3550 M5 server.

Table 6. Memory options

Part number	Feature code	Description	Maximum supported	Standard models where used
RDIMMs - 2133 MHz				
46W0784	A5B6	4GB TruDDR4 Memory (1Rx8, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24 (12 per CPU)	-
46W0788	A5B5	8GB TruDDR4 Memory (1Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24 (12 per CPU)	-
46W0792	A5B8	8GB TruDDR4 Memory (2Rx8, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24 (12 per CPU)	A2x, B2x
46W0796	A5B7	16GB TruDDR4 Memory (2Rx4, 1.2V) PC4-17000 CL15 2133MHz LP RDIMM	24 (12 per CPU)	62x, C2x, C4x, D2x, F2x, G2x, H2x, J2x, L2x, M2x
LRDIMMs - 2133 MHz				
46W0800	A5B9	32GB TruDDR4 Memory (4Rx4, 1.2V) PC417000 CL15 2133MHz LP LRDIMM	24 (12 per CPU)	-
95Y4812	A5UK	64GB TruDDR4 Memory (4Rx4,1.2V) PC4-17000 CL15 2133MHz LP LRDIMM	24 (12 per CPU)	-

* Support for 64 GB LRDIMMs is planned for a later date.

Internal storage

The System x3550 M5 server supports the following internal drive bay configurations:

1. 4x 2.5-inch SAS/SATA hot-swap drive bay server models that can be upgraded to 8x 2.5-inch SAS/SATA hot-swap drive bays

2. 10x 2.5-inch SAS/SATA hot-swap drive bay server models that can be upgraded to 12x 2.5-inch SAS/SATA hot-swap drive bays (10x front drive bays and 2x rear drive bays)

3. 4x 2.5-inch SATA Simple Swap drive bay server models that can be upgraded to 8x 2.5-inch SATA Simple Swap drive bays

4. 4x 3.5-inch SAS/SATA hot-swap drive bay server models

5. 4x 3.5-inch SATA Simple Swap drive bay server models

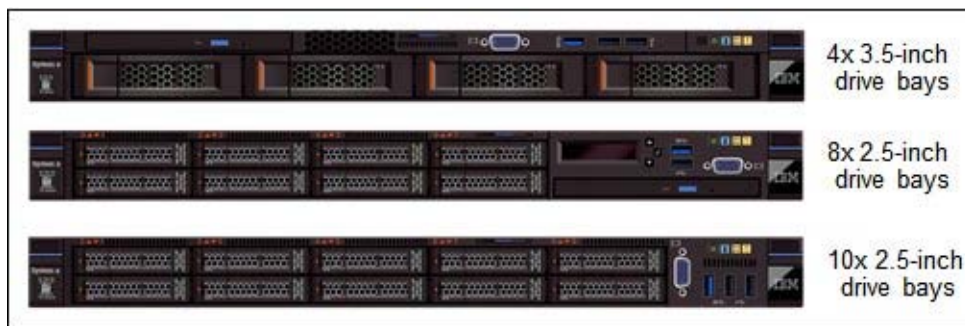The following figure shows some of these configurations.

Figure 5. Internal drive configurations

Optical drive support: Four- and eight-drive bay models of the x3550 M5 support an optional internal optical drive.

The following table shows the internal storage options available for the x3550 M5 server.

Table 7. Internal storage options

Part number	Feature code	Description	Maximum supported	Standard models where used
Base drive kits				
None*	A59W	System x3550 M5 4x 2.5" HS HDD Kit	1	62x, C2x, D2x, F2x, H2x, J2x, L2x, M2x
None*	A5A4	System x3550 M5 4x 3.5" HS HDD Kit	1	C4x
None*	A5A0	System x3550 M5 10x 2.5" HS HDD Kit	1	G2x
None**	A59Y	System x3550 M5 4x 2.5" SS HDD Kit, Non-Raid	1	-
None**	A5A5	System x3550 M5 4x 3.5" SS HDD Kit, Non-Raid	1	-
None*	A5A6	System x3550 M5 4x 2.5" SS HDD Kit, HW RAID	1	A2x
None*	A5A8	System x3550 M5 4x 3.5" SS HDD Kit, HW RAID	1	B2x
Upgrade drive kits (require the base drive kit)				
00KA058	A5A2	System x3550 M5 2x 2.5" HS HDD Rear Kit	1	-
00KA055	A59X	System x3550 M5 4x 2.5" HS HDD Kit PLUS	1	-
00KA056	A59Z	System x3550 M5 4x 2.5" SS HDD Kit PLUS, Non-Raid	1	-
00KA060	A5A7	System x3550 M5 4x 2.5" SS HDD Kit PLUS, HW RAID	1	-

* Available in standard or CTO models.
** Available in CTO models only.

Base drive kits are always factory installed in either standard or custom (CTO) models. Upgrade drive kits can be factory installed or can be installed as a field upgrade for supported standard or custom models.

Note: The HDD Rear Kit (00KA058) is installed in place of the PCIe slots 1 and 2 (see the "I/O expansion options" section), and it includes a special riser that provides PCIe 3.0 x16 slot 3. No other riser cards can be used when the HDD Rear Kit is installed. The HDD Rear Kit is connected to the SAS expander on the 10-drive backplane.

The following table lists possible internal storage configurations.

Table 8. Internal storage configurations (FC=Feature Code, PN=Part Number, qty=quantity) (Part 1)

Drive bay type	Drive bay qty	Storage controller	Drive kits required
2.5-inch SAS/SATA hot-swap	4	• 1x M1215; or • 1x M5210; or • 1x N2215	Factory installed: • 1x System x3550 M5 4x 2.5" HS HDD Kit (FC A59W)
	8	• 1x M1215; or • 1x M5210; or • 1x N2215	Factory installed: • 1x System x3550 M5 4x 2.5" HS HDD Kit (FC A59W); and • 1x System x3550 M5 4x 2.5" HS HDD Kit PLUS (FC A59X) Field upgrade for the 4-drive bay model: • 1x System x3550 M5 4x 2.5" HS HDD Kit PLUS (PN 00KA055)
	10	• 1x M1215; or • 1x M5210; or • 1x N2215	Factory installed: • 1x System x3550 M5 10x 2.5" HS HDD Kit (FC A5A0)
	12	• 1x M1215; or • 1x M5210; or • 1x N2215	Factory installed: • 1x System x3550 M5 10x 2.5" HS HDD Kit (FC A5A0); and • 1x System x3550 M5 2x 2.5" HS HDD Rear Kit (FC A5A2) Field upgrade for the 10-drive bay model: • 1x System x3550 M5 2x 2.5" HS HDD Rear Kit (PN 00KA058)

Table 8. Internal storage configurations (FC=Feature Code, PN=Part Number, qty=quantity) (Part 2)

Drive bay type	Drive bay qty	Storage controller	Drive kits required
2.5-inch SATA Simple Swap	4	● Integrated 8-port 6 Gbps SATA (no RAID support)	Factory installed: ● 1x System x3550 M5 4x 2.5" SS HDD Kit, Non-Raid (FC A59Y)
		● 1x M1215; or ● 1x M5210; or ● 1x N2215	Factory installed: ● 1x System x3550 M5 4x 2.5" SS HDD Kit, HW RAID (FC A5A6)
	8	● Integrated 8-port 6 Gbps SATA (no RAID support)	Factory installed: ● 1x System x3550 M5 4x 2.5" SS HDD Kit, Non-Raid (FC A59Y); and ● 1x System x3550 M5 4x 2.5" SS HDD Kit PLUS, Non-Raid (FC A59Z) Field upgrade for the 4-drive bay model: ● 1x System x3550 M5 4x 2.5" SS HDD Kit PLUS, Non-Raid (PN 00KA056)
		● 1x M1215; or ● 1x M5210; or ● 1x N2215	Factory installed: ● 1x System x3550 M5 4x 2.5" SS HDD Kit, HW RAID (FC A5A6); and ● 1x System x3550 M5 4x 2.5" SS HDD Kit PLUS, HW RAID (FC A5A7) Field upgrade for the 4-drive bay model: ● 1x System x3550 M5 4x 2.5" SS HDD Kit PLUS, HW RAID (PN 00KA060)
3.5-inch SAS/SATA hot-swap	4	● 1x M1215; or ● 1x M5210; or ● 1x N2215	Factory installed: ● 1x System x3550 M5 4x 3.5" HS HDD Kit (FC A5A4)
3.5-inch SATA Simple Swap	4	● Integrated 8-port 6 Gbps SATA (no RAID support)	Factory installed: ● 1x System x3550 M5 4x 3.5" SS HDD Kit, Non-Raid (FC A5A5)
		● 1x M1215; or ● 1x M5210; or ● 1x N2215	Factory installed: ● 1x System x3550 M5 4x 3.5" SS HDD Kit, HW RAID (FC A5A8)

Controllers for internal storage

The following table lists the RAID controllers and the additional options used for the internal storage of the x3550 M5 server. The controllers are installed into a dedicated PCIe slot.

Table 9. RAID controllers and HBAs for internal storage

Part number	Feature code	Description	Maximum supported	Standard models where used
12 Gb SAS/SATA controllers				
46C9110	A3YZ	ServeRAID M5210 SAS/SATA Controller	1	62x, D2x, F2x, G2x, H2x, J2x, L2x, M2x
46C9114	A45W	ServeRAID M1215 SAS/SATA Controller	1	A2x, B2x, C2x, C4x
47C8675	A3YY	N2215 SAS/SATA HBA	1	-
Hardware upgrades for the M5210				
47C8656	A3Z0	ServeRAID M5200 Series 1GB Cache/RAID 5 Upgrade	1	-
47C8660	A3Z1	ServeRAID M5200 Series 1GB Flash/RAID 5 Upgrade	1	D2x, F2x, G2x, H2x
47C8664	A3Z2	ServeRAID M5200 Series 2GB Flash/RAID 5 Upgrade	1	62x, J2x
47C8668	A3Z3	ServeRAID M5200 Series 4GB Flash/RAID 5 Upgrade	1	-
Features on Demand upgrades for the M5210				
47C8708	A3Z6	ServeRAID M5200 Series Zero Cache/RAID 5 Upgrade	1	-
47C8706	A3Z5	ServeRAID M5200 Series RAID 6 Upgrade	1*	-
47C8710	A3Z7	ServeRAID M5200 Series Performance Accelerator	1*	-
47C8712	A3Z8	ServeRAID M5200 Series SSD Caching Enabler	1*	-
Features on Demand upgrades for the M1215				
00AE930	A5H5	ServeRAID M1200 Zero Cache/RAID 5 Upgrade for FOD	1	-

* Requires cache memory upgrade (47C8656, 47C8660, 47C8664, or 47C8668).

The ServeRAID M1215 SAS/SATA Controller has the following specifications:

● Eight internal 12 Gbps SAS/SATA ports
● Up to 12 Gbps throughput per port
● Two internal mini-SAS HD connectors (SFF-8643)
● Supports connections to SAS/SATA HDDs and SSDs
● LSI SAS3008 12 Gbps RAID on Chip (ROC) controller
● Support for RAID levels 0, 1, and 10 standard; support for RAID 5, 50 with optional FoD upgrade
● Zero Controller Cache, no battery/flash backup
● Optional support for self-encrypting drives (SEDs) with MegaRAID SafeStore (with RAID 5 upgrade)
● Fixed stripe size of 64 KB

The ServeRAID M5210 SAS/SATA Controller has the following specifications:

● Eight internal 12 Gbps SAS/SATA ports
● Up to 12 Gbps throughput per port
● Two x4 HD mini-SAS internal connectors (SFF-8643)
● Supports connections to SAS/SATA HDDs and SSDs and SAS Expanders
● Supports RAID 0, 1, and 10
● Supports RAID 5 and 50 with optional M5200 Series RAID 5 upgrades
● Supports RAID 6 and 60 with the optional M5200 Series RAID 6 upgrade
● Optional support for self-encrypting drives (SEDs) with MegaRAID SafeStore (with RAID 5 upgrade)
● Supports 1 GB non-backed cache or 1 GB, 2 GB, or 4 GB flash-backed cache
● PCIe 3.0 x8 host interface
● Based on the LSI SAS3108 12 Gbps ROC controller

The N2215 SAS/SATA HBA has the following specifications:

● Eight internal 12 Gbps SAS/SATA ports
● Up to 12 Gbps throughput per port
● Two x4 HD mini-SAS internal connectors (SFF-8643)
● Supports connections to SAS/SATA HDDs and SSDs
● Optimized for SSD performance
● No RAID support
● PCIe 3.0 x8 host interface
● Based on the LSI SAS3008 12 Gbps controller

For more information, see the list of Product Guides in the RAID adapters category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=raid

Internal drive options

The following table lists hard drive options for internal disk storage of the x3550 M5 server.

Table 10. Drive options for internal disk storage (Part 1)

Part number	Feature code	Description	Maximum supported
3.5-inch hot-swap 512e HDDs - 12 Gbps NL SAS			
00FN188	A5VP	2TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	4
00FN208	A5VQ	4TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	4
00FN228	A5VR	6TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e HDD	4
3.5-inch hot-swap HDDs - 6 Gbps NL SAS			
90Y8572	A2U0	2TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD	4
90Y8577	A2R2	3TB 7.2K 6Gbps NL SAS 3.5" G2HS HDD	4
3.5-inch hot-swap 512e SEDs - 12 Gbps NL SAS			
00FN238	A5VS	2TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e SED	4
00FN248	A5VT	4TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e SED	4
00FN258	A5VU	6TB 7.2K 12Gbps NL SAS 3.5" G2HS 512e SED	4
3.5-inch hot-swap 512e HDDs - 6 Gbps NL SATA			
00FN113	A5VD	2TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	4
00FN128	A5VF	3TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	4
00FN143	A5VH	4TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	4
00FN158	A5VK	5TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	4
00FN173	A5VM	6TB 7.2K 6Gbps NL SATA 3.5" G2HS 512e HDD	4
3.5-inch hot-swap HDDs - 6 Gbps NL SATA			
81Y9794	A22T	2TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	4
81Y9798	A22S	3TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	4
49Y6002	A3W9	4TB 7.2K 6Gbps NL SATA 3.5" G2HS HDD	4
3.5-inch simple-swap 512e HDDs - 6 Gbps NL SATA			
00FN118	A5VE	2TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	4
00FN133	A5VG	3TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	4
00FN148	A5VJ	4TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	4
00FN163	A5VL	5TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	4
00FN178	A5VN	6TB 7.2K 6Gbps NL SATA 3.5" G2SS 512e HDD	4

Table 10. Drive options for internal disk storage (Part 2)

Part number	Feature code	Description	Maximum supported
3.5-inch simple-swap HDDs - 6 Gbps NL SATA			
81Y9810	A22W	2TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	4
81Y9814	A22V	3TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	4
49Y6012	A3WA	4TB 7.2K 6Gbps NL SATA 3.5" G2SS HDD	4
2.5-inch hot-swap 10K 512e HDDs - 12 Gbps SAS			
00NA241	ASBF	600GB 10K 12Gbps SAS 2.5" G3HS 512e HDD	12
00NA251	ASBH	900GB 10K 12Gbps SAS 2.5" G3HS 512e HDD	12
00NA261	ASBK	1.2TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	12
00NA271	ASBM	1.8TB 10K 12Gbps SAS 2.5" G3HS 512e HDD	12
2.5-inch hot-swap 10K 512e SEDs - 12 Gbps SAS			
00NA291	ASBR	600GB 10K 12Gbps SAS 2.5" G3HS 512e SED	12
00NA296	ASBS	900GB 10K 12Gbps SAS 2.5" G3HS 512e SED	12
00NA301	ASBT	1.2TB 10K 12Gbps SAS 2.5" G3HS 512e SED	12
00NA306	ASBU	1.8TB 10K 12Gbps SAS 2.5" G3HS 512e SED	12
2.5-inch hot-swap 10K HDDs - 6 Gbps SAS			
00AJ096	A4TL	300GB 10K 6Gbps SAS 2.5" G3HS HDD	12
00AJ091	A4TM	600GB 10K 6Gbps SAS 2.5" G3HS HDD	12
00AJ071	A4TN	900GB 10K 6Gbps SAS 2.5" G3HS HDD	12
00AJ146	A4TP	1.2TB 10K 6Gbps SAS 2.5" G3HS HDD	12
2.5-inch hot-swap 15K 512e HDDs - 12 Gbps SAS			
00NA221	ASBB	300GB 15K 12Gbps SAS 2.5" G3HS 512e HDD	12
00NA231	ASBD	600GB 15K 12Gbps SAS 2.5" G3HS 512e HDD	12
2.5-inch hot-swap 15K 512e SEDs - 12 Gbps SAS			
00NA281	ASBP	300GB 15K 12Gbps SAS 2.5" G3HS 512e SED	12
00NA286	ASBQ	600GB 15K 12Gbps SAS 2.5" G3HS 512e SED	12
2.5-inch hot-swap 15K 512e Hybrid - 12 Gbps SAS			
00NA311	ASBV	300GB 15K 12Gbps SAS 2.5" G3HS 512e Hybrid	12
00NA321	ASBX	600GB 15K 12Gbps SAS 2.5" G3HS 512e Hybrid	12
2.5-inch hot-swap 15K HDDs - 6 Gbps SAS			
00AJ081	A4TR	300GB 15K 6Gbps SAS 2.5" G3HS HDD	12
00AJ126	A4TS	600GB 15K 6Gbps SAS 2.5" G3HS HDD	12

Table 10. Drive options for internal disk storage (Part 3)

Part number	Feature code	Description	Maximum supported
2.5-inch hot-swap HDDs - 6 Gbps NL SAS			
00AJ121	A4TT	500GB 7.2K 6Gbps NL SAS 2.5" G3HS HDD	12
00AJ086	A4TU	1TB 7.2K 6Gbps NL SAS 2.5" G3HS HDD	12
2.5-inch hot-swap HDDs - 6 Gbps NL SATA			
00AJ136	A4TW	500GB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	12
00AJ141	A4TX	1TB 7.2K 6Gbps NL SATA 2.5" G3HS HDD	12
2.5" hot-swap 12 Gbps SAS SSDs - Enterprise			
00FN379	AS7C	200GB 12G SAS 2.5" MLC G3HS Enterprise SSD	12
00FN389	AS7E	400GB 12G SAS 2.5" MLC G3HS Enterprise SSD	12
00FN399	AS7G	800GB 12G SAS 2.5" MLC G3HS Enterprise SSD	12
00FN409	AS7J	1.6TB 12G SAS 2.5" MLC G3HS Enterprise SSD	12
2.5" hot-swap 12 Gbps SAS SED SSDs - Enterprise			
00FN419	AS7L	400GB SED 12G SAS 2.5" MLC G3HS Enterprise SSD	12
00FN424	AS7M	800GB SED 12G SAS 2.5" MLC G3HS Enterprise SSD	12
2.5" simple-swap 12 Gbps SAS SSDs - Enterprise			
00FN384	AS7D	200GB 12G SAS 2.5" MLC G3SS Enterprise SSD	8
00FN394	AS7F	400GB 12G SAS 2.5" MLC G3SS Enterprise SSD	8
00FN404	AS7H	800GB 12G SAS 2.5" MLC G3SS Enterprise SSD	8
00FN414	AS7K	1.6TB 12G SAS 2.5" MLC G3SS Enterprise SSD	8
2.5" hot-swap 6 Gbps SAS SSDs - Enterprise			
00AJ217	A4UC	800GB SAS 2.5" MLC G3HS Enterprise SSD	12
2.5" hot-swap 6 Gbps SATA SSDs - Enterprise Value			
00AJ161	A4U4	S3700 400GB SATA 2.5" MLC G3HS Enterprise SSD for System x	12
00AJ405	A579	480GB SATA 2.5" MLC G3HS Enterprise Value SSD	12
00FN347	AS0J	960GB SATA 2.5" MLC G3HS Entry SSD	12
2.5" simple-swap 6 Gbps SATA SSDs - Enterprise Value			
00FN475	AS5Z	960GB SATA 2.5" MLC G3SS Entry SSD	8

Internal backup units

The x3550 M5 server does not support internal tape drive options or other internal backup units. However, it can be attached to the external tape drives using SAS or Fibre Channel connectivity (see Table 31).

Optical drives

The x3550 M5 server supports the optical drive options listed in the following table. Server models with ten 2.5-inch drive bays on the front do not support an internal optical drive; a supported external optical drive can be used instead.

Table 11. Optical drives

Part number	Feature code	Description	Maximum supported	Standard models where used
00AM066	A5KG	Ultraslim 9.5mm SATA DVD-ROM	1	-
00AM067	A5KH	Ultraslim 9.5mm SATA Multi Burner	1	-

Ultraslim 9.5mm SATA DVD-ROM (part number 00AM066) supports the following media and speeds for reading:

- CD-ROM 24X
- CD-DA (DAE) 24X
- CD-R 24X
- CD-RW 24X
- DVD-ROM 8X
- DVD-R 8X
- DVD+R 8X
- DVD-R DL 6X
- DVD+R DL 8X
- DVD-RW 8X
- DVD+RW 8X
- DVD-RAM (4.7 GB) 5X

Ultraslim 9.5mm SATA Multi Burner (part number 00AM067) supports the same media and speeds for reading as DVD-ROM (part number 00AM066). This drive also supports the following media and speeds for writing:

- CD-R 24X
- CD-RW 4X
- High-Speed CD-RW 10X
- Ultra Speed CD-RW 24X
- DVD-R 8X
- DVD+R 8X
- DVD-R DL 6X
- DVD+R DL 6X
- DVD-RW 6X
- DVD+RW 8X
- DVD-RAM 5X

I/O expansion options

The x3550 M5 server supports up to four PCIe slots: one on the system planar that is dedicated for an internal RAID controller and up to three with different riser cards installed into two riser sockets on the system planar (one riser socket supports the installation of one riser card). The slot form factors are listed:

- Slot 1: PCIe 3.0 x16 or ML2; low profile, half-length (not present if the HDD Rear Kit is installed)
- Slot 2: PCIe 3.0 x16 or PCIe 3.0 x8; low profile or full-height, half-length (PCIe 3.0 x16 slot requires the second processor to be installed) (not present if the HDD Rear Kit is installed)
- Slot 3: PCIe 3.0 x16 or PCIe 3.0 x8; low profile, half-length
- Slot 4: PCIe 3.0 x8 (dedicated for an internal RAID controller)

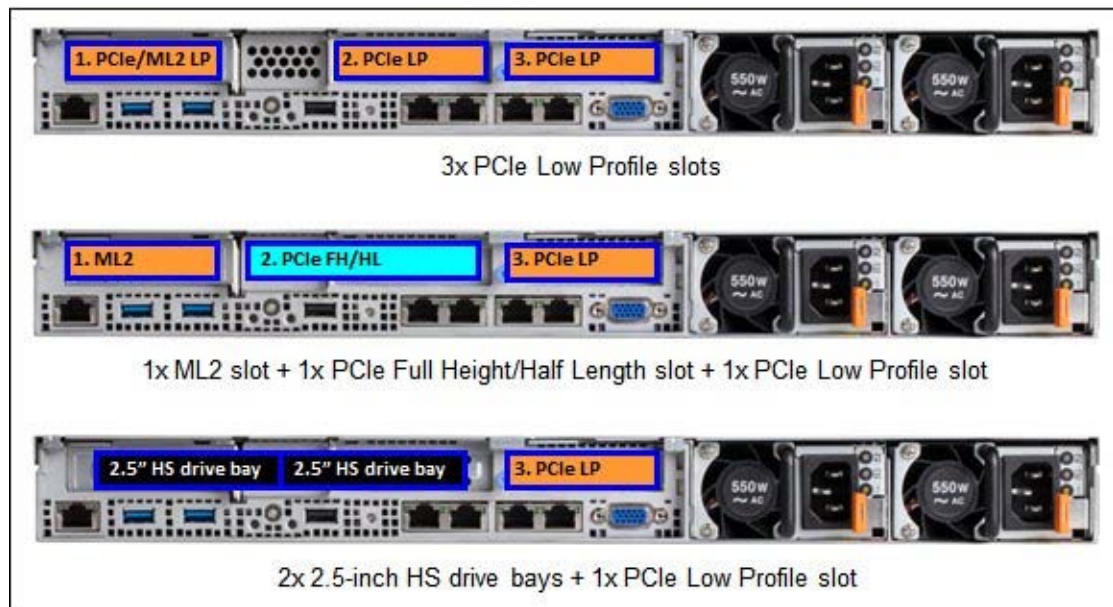The locations of the PCIe slots are shown in the following figure.

Figure 6. PCIe slot locations

Riser 1 supplies slot 1, and riser 2 supplies slots 2 and 3. All standard models have one riser card (Riser 1) installed, which provides one low profile PCIe x16 Gen 3 slot (riser option part number 00KA061). You can replace the first riser card or add a second riser card with the riser card options that are listed in the following table (or configure these riser cards to be factory-integrated using special bid or CTO).

Table 12. PCI riser card options

Part number	Feature code	Description	Maximum supported	Standard models where used
Riser 1 (supplies slots 1)				
00KA061	A5AG	System x3550 M5 PCIe Riser 1 (1x LP x16 CPU0)	1	62x, J2x, A2x, B2x, C2x, C4x, D2x, F2x, G2x, H2x, L2x, M2x
00KA063	A5AH	System x3550 M5 PCIe Riser 1 (1x ML2 x16 CPU0)	1	-
Riser 2 (supplies slots 2 and 3)				
00KA062	A5AC	System x3550 M5 PCIe Riser 2, 1 CPU (2xLP, LP x8 CPU0 + LP x8 CPU0)	1	-
None*	A5AD	System x3550 M5 PCIe Riser 2, 1-2 CPU (FHHL x16 CPU1 + LP x16 CPU0)	1	-
None*	A5AE	System x3550 M5 PCIe Riser 2, 1 CPU (FHHL x8 CPU0 +LP x8 CPU0)	1	-
00KA066	A5AF	System x3550 M5 PCIe Riser 2, 1-2 CPU (LP x16 CPU1 + LP x16 CPU0)	1	-

* Only available via CTO or special bid.

Note: The HDD Rear Kit (00KA058; see the "Internal storage" section) is installed in place of the PCIe slots 1 and 2, and it includes a special riser that provides PCIe 3.0 x16 slot 3. No other riser cards can be used when the HDD Rear Kit is installed.

The x3550 M5 Thermal Kit, part number 00KA059, contains two fans. It provides the seventh and eighth system fans needed for the following options when only one processor is installed:

● Intel X540 ML2 Dual Port 10GbaseT Adapter for System x
● QLogic 8200 Dual Port 10GbE SFP+ VFA for System x

The x3550 M5 Thermal Kit is not needed if two processors are installed, because the second processor includes these fans.

The COM Port Bracket, part number 00KA161, is used for mounting the external serial port on the rear of the x3550 M5. This option includes the bracket and the cable. The COM Port option is mounted in place of the PCIe slot 3, and only PCIe slots 1 and 2 remain available.

The following table lists the x3550 M5 Thermal Kit and COM Port Bracket part numbers.

Table 13. Miscellaneous options

Part number	Feature code	Description	Maximum supported
00KA059	A5AJ	System x3550 M5 Thermal Kit	1
00KA161	A5AN	COM Port Bracket	1

Network adapters

The x3550 M5 supports four integrated Gigabit Ethernet ports.

The integrated network interface controller (NIC) has the following features:

- A Broadcom BCM5719 chip

- Four Gigabit Ethernet ports

- NIC Teaming (load balancing and failover)

- Ethernet features:

  - Compliant with 1 Gb Ethernet IEEE 802.3, 802.3u, and 802.3ab PHY specifications
  - Integrated PHY for 10/100/1000 Mbps for multispeed, full, and half-duplex auto-negotiation
  - Automatic MDI crossover
  - IEEE 802.3x-compliant flow control support
  - IEEE 1588 protocol and 802.1AS time synchronization implementation
  - IEEE802.3az - Energy Efficient Ethernet (EEE)

- I/O Virtualization features:

  - I/O Virtualization support for VMware NetQueue and Microsoft virtual machine queue (VMQ)
  - Function Level Reset (FLR)
  - IEEE 802.1q Virtual Local Area Network (VLAN) tagging support

- Stateless offload and performance features:

  - TCP, IP, and User Datagram Protocol (UDP) checksum offload
  - TCP segmentation offload (TCO)
  - Large Send Offload (LSO)
  - Receive Side Scaling (RSS) and Transmit Side Scaling (TSS)
  - Message Signal Interrupt (MSI) and Message Signal Interrupt Extension (MSI-X) support
  - Support for jumbo frames up to 9600 bytes

Optionally, the x3550 M5 server supports ML2 adapters that are installed in the custom ML2 slot provided by the PCIe ML2 riser card (part number 00KA063). This slot supports adapters with either two 10 Gb ports or four Gigabit ports and supports direct connectivity to the IMM2 service processor for out-of-band systems management.

The following table lists additional supported network adapters.

Table 14. Network adapters (Part 1)

Part number	Feature code	Description	Maximum supported
40 Gb Ethernet - ML2			
00FP650	A5RK	Mellanox ConnectX-3 Pro ML2 2x40GbE/FDR VPI Adapter for System x*	1
10 Gb Ethernet - ML2			
00D2026	A40S	Broadcom NetXtreme II ML2 Dual Port 10GbaseT for System x	1
00D2028	A40T	Broadcom NetXtreme II ML2 Dual Port 10GbE SFP+ for System x*	1
00D1996	A40Q	Emulex VFA5 ML2 Dual Port 10GbE SFP+ Adapter for System x*	1
00D8544	A4NZ	Emulex VFA5 ML2 FCoE/iSCSI License for System x (FoD) (Features on Demand upgrade for 00D1996 - one for each adapter)	1
00D1994	A40P	Intel X540 ML2 Dual Port 10GbaseT Adapter for System x	1
94Y5200	AS74	Intel X710 ML2 4x10GbE SFP+ Adapter for System x*	1
1 Gb Ethernet - ML2			
00D1998	A40R	Intel I350-T4 ML2 Quad Port GbE Adapter for System x	1
40 Gb Ethernet / FDR InfiniBand - PCIe			
00D9550	A3PN	Mellanox ConnectX-3 40GbE / FDR IB VPI Adapter for System x*	3
10 Gb Ethernet - PCIe			
44T1370	A5GZ	Broadcom NetXtreme 2x10GbE BaseT Adapter for System x	3
94Y5180	A4Z6	Broadcom NetXtreme Dual Port 10GbE SFP+ Adapter for System x*	3
00JY820	A5UT	Emulex VFA5 2x10 GbE SFP+ PCIe Adapter for System x*	3
00JY824	A5UV	Emulex VFA5 FCoE/iSCSI SW for PCIe Adapter for System x (FoD) (Features on Demand upgrade for 00JY820 - one for each adapter)	3
00JY830	A5UU	Emulex VFA5 2x10 GbE SFP+ Adapter and FCoE/iSCSI SW for System x*	3
49Y7960	A2EC	Intel X520 Dual Port 10GbE SFP+ Adapter for System x*	3
81Y3520	AS73	Intel X710 2x10GbE SFP+ Adapter for System x	1
00D9690	A3PM	Mellanox ConnectX-3 10 GbE Adapter for System x*	3
90Y4600	A3MR	Qlogic 8200 Dual Port 10GbE SFP+ VFA for System x*	3
00Y5624	A3MT	Qlogic 8200 VFA FCoE/iSCSI License for System x (FoD) (Features on Demand upgrade for 90Y4600 - one for each adapter)	3
47C9977	A522	Solarflare SFN7122F 2x10GbE SFP+ Flareon Ultra for System x	3

Table 14. Network adapters (Part 2)

Part number	Feature code	Description	Maximum supported
1 Gb Ethernet - PCIe			
90Y9370	A2V4	Broadcom NetXtreme I Dual Port GbE Adapter for System x	3
90Y9352	A2V3	Broadcom NetXtreme I Quad Port GbE Adapter for System x	3
00AG510	A56L	Intel I350-T2 2xGbE BaseT Adapter for System x	3
00AG520	A56M	Intel I350-T4 4xGbE BaseT Adapter for System x	3

* SFP+ and QSFP+ based adapters require supported transceivers or DAC cables that must be purchased separately.

For more information, see the list of Product Guides in the Networking adapters category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=networkadapters

Storage host bus adapters

The following table lists storage HBAs supported by the x3550 M5 server.

Table 15. Storage adapters

Part number	Feature code	Description	Maximum supported
Fibre Channel - 16 Gb			
81Y1675	A2XV	Brocade 16Gb FC Dual-port HBA for System x	3
81Y1668	A2XU	Brocade 16Gb FC Single-port HBA for System x	3
81Y1662	A2W6	Emulex 16Gb FC Dual-port HBA for System x	3
81Y1655	A2W5	Emulex 16Gb FC Single-port HBA for System x	3
00Y3337	A3KW	QLogic 16Gb FC Single-port HBA for System x	3
00Y3341	A3KX	QLogic 16Gb FC Dual-port HBA for System x	3
Fibre Channel - 8 Gb			
46M6050	3591	Brocade 8Gb FC Dual-port HBA for System x	3
46M6049	3589	Brocade 8Gb FC Single-port HBA for System x	3
42D0494	3581	Emulex 8Gb FC Dual-port HBA for System x	3
42D0485	3580	Emulex 8Gb FC Single-port HBA for System x	3
42D0510	3579	QLogic 8Gb FC Dual-port HBA for System x	3
42D0501	3578	QLogic 8Gb FC Single-port HBA for System x	3
SAS			
00AE912	A5M0	N2225 SAS/SATA HBA for System x	3
00AE916	A5M1	N2226 SAS/SATA HBA for System x	1

For more information, see the list of Product Guides in the Host bus adapters category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=hba

PCIe SSD adapters

The x3550 M5 server supports the High IOPS PCIe SSD adapters listed in the following table.

Table 16. High IOPS PCIe SSD adapters

Part number	Feature code	Description	Maximum supported
Enterprise			
00AE995	ARYP	1000GB Enterprise io3 Flash Adapter for System x	2
00AE998	ARYQ	1300GB Enterprise io3 Flash Adapter for System x	2
00JY001	ARYR	2600GB Enterprise io3 Flash Adapter for System x	2
00JY004	ARYS	5200GB Enterprise io3 Flash Adapter for System x	1*
Enterprise Value			
00AE983	ARYK	1250GB Enterprise Value io3 Flash Adapter for System x	2
00AE986	ARYL	1600GB Enterprise Value io3 Flash Adapter for System x	2
00AE989	ARYM	3200GB Enterprise Value io3 Flash Adapter for System x	2
00AE992	ARYN	6400GB Enterprise Value io3 Flash Adapter for System x	1*

* The 5200GB and 6400GB io3 Flash Adapters cannot be factory installed; they are supported as field-installable options only. The server cannot be shipped with these adapters installed.

GPU adapters

The x3550 M5 server supports a graphics processing units (GPUs) listed in the following table.

Table 17 GPU adapters

Part number	Feature code	Description	Maximum supported
None*	A3WH	NVIDIA Quadro K600	1

* These GPU adapters are available via Special Bid or CTO only.

If the NVIDIA Quadro K600 is installed, the maximum memory that can be installed is 1 TB.

Power supplies

The x3550 M5 server supports up to two redundant power supplies, and is capable of N+N redundancy depending on the configuration. Standard models come with one power supply. The following table lists the power supplies.

Table 18. Power supplies

Part number	Feature code	Description	Maximum supported	Standard models where used
00KA094	A5AX	System x 550W High Efficiency Platinum AC Power Supply	2	A2x, B2x, C2x, C4x, D2x, F2x, G2x, H2x
00KA096	A5AY	System x 750W High Efficiency Platinum AC Power Supply	2	62x, J2x
00KA097	A5AZ	System x 750W High Efficiency Titanium AC Power Supply (200-240V)	2	L2x
00KA098	A5B0	System x 900W High Efficiency Platinum AC Power Supply	2	M2x

General power supply rules are listed:

- Minimum of one and maximum of two power supplies per system
- If two are installed, power supplies must be identical

550W power supply restrictions

- GPUs not supported
- 120 W, 135 W, and 145 W processors not supported
- Maximum eight RDIMMs or four LRDIMMs
- Maximum eight drives

750W power supply restrictions

- 145 W processors:

  - Maximum 16 RDIMMs or eight LRDIMMs

- Other than 145 W processors:

  - Maximum 12 LRDIMMs
  - Maximum eight drives

A hot-swap power supply option ships standard with one 2.8m, 10A/100-250V, IEC 320-C13 to IEC 320-C14 rack power cable. Other country-specific and rack cables can be ordered if needed (see the following table).

Table 19. Power cables

Part number	Feature code	Description
Rack power cables		
39Y7932	6263	4.3m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
39Y7937	6201	1.5m, 10A/100-250V, C13 to IEC 320-C14 Rack Power Cable
39Y7938	6204	IEC309 C20 to C13 rack jumper cable
Country-specific power cords		
39Y7917	6212	European 10A line C13 to CEE 7/7 (2.8M)
39Y7918	6213	Denmark 10A line C13 to DK2-5A (2.8M)
39Y7919	6216	Switzerland 10A line C13 to SEV 1011 (2.8M)
39Y7920	6218	Israel 10A line C13 to SI 32 (2.8M)
39Y7921	6217	Italy 10A line C13 to CEE 7/7 (2.8M)
39Y7922	6214	South Africa 10A line C13 to SABS 164/1 (2.8M)
39Y7923	6215	United Kingdom 10A line C13 to BS 1363 (2.8M)
39Y7924	6211	Australia/NZ 10A line C13 to SAA-AS C112 (2.8M)
39Y7925	6219	Korea 7A line C13 to KETI 15A/250V (2.8M)
39Y7927	6269	India 6A line C13 to Fig 68 (2.8M)
39Y7928	6210	China 6A line C13 to GB 2099.1 (2.8M)
39Y7929	6223	Brazil 10A line C13 to NBR 6147 (2.8M)
39Y7930	6222	Argentina 10A line C13 to IRAM 2063 (2.8M)
39Y7931	6207	Power Cable - C13 / NEMA 5-15P 14ft
00CG265	A53E	Power Cord Taiwan AC plug 10A/250V, 2.8M; OPT
00CG267	A53F	Power Cord Taiwan AC plug 15A/125V; 2.8M; OPT
46M2592	A1RF	10A/250V C13 to NEMA 6-15P 2.8m line cord
46M2593	A1RE	Japan 10A/100V C13 to JIS C-8303 2.8m line cord

Integrated virtualization

The server supports VMware ESXi installed on a USB memory key. The key is installed in a USB socket inside the server. The following table lists the virtualization options.

Table 20. Virtualization options

Part number	Feature code	Description	Maximum supported
41Y8298	A2G0	Blank USB Memory Key for VMware ESXi Downloads	1

Systems management

The server contains Integrated Management Module II (IMM2.1), which provides advanced service-processor control, monitoring, and an alerting function. If an environmental condition exceeds a threshold or if a system component fails, the IMM lights LEDs to help you diagnose the problem, records the error in the event log, and alerts you to the problem. Optionally, the IMM also provides a virtual presence capability for remote server management capabilities.

The IMM provides remote server management through industry-standard interfaces:

- Intelligent Platform Management Interface (IPMI) Version 2.0
- Simple Network Management Protocol (SNMP) Version 3
- Common Information Model (CIM)
- Web browser

The optional Integrated Management Module Advanced Upgrade is required to enable the remote presence and blue-screen capture features. The remote presence feature provides the following functions:

- Remotely viewing video with graphics resolutions up to 1600x1200 at 75 Hz with up to 23 bits per pixel, regardless of the system state
- Remotely accessing the server using the keyboard and mouse from a remote client
- Mapping the CD or DVD drive, diskette drive, and USB flash drive on a remote client, and mapping ISO and diskette image files as virtual drives that are available for use by the server
- Uploading a diskette image to the IMM memory and mapping it to the server as a virtual drive

The blue-screen capture feature captures the video display contents before the IMM restarts the server when the IMM detects an operating system hang condition. A system administrator can use the blue-screen capture to assist in determining the cause of the hang condition. The following table lists the remote management option.

Table 21. Remote management option

Part number	Feature code	Description	Maximum supported
90Y3901	A1ML	Integrated Management Module Advanced Upgrade	1

All standard models ship with basic light path diagnostics, which include the system LEDs on the front of the server (See Figure 2) and the LEDs near the monitored components (for example, the DIMM error LED on the system board). Standard models with 2.5-inch drive bays and the basic light path can be upgraded to a next-gen light path LCD display panel. The LCD display enables you to have quick access to system status, firmware, network, and health information. Configure-to-order (CTO) customers can also elect to have a next-gen ligh path LCD panel for models with 2.5-inch drive bays. The following table shows the LCD display panel ordering information.

Table 22. Light path diagnostics options

Part number	Feature code	Description	Maximum supported	Standard models where used
00KA054	A5AB	System x Advanced LCD Light path Kit	1	-

The following x3550 M5 Express models have the Advanced LCD Light path Kit standard: E1x, E2x, E3x, E4x, E5x, E6x, E7x, EAx, EBx, ECx, EDx, EEx, EFx, EHx, EJx, EKx, ELx, ENx, EPx, EQx, ERx, and ESx.

IBM Security Key Lifecycle Manager for System x SEDs - FoD (SKLM - FoD) is an optional feature available in System x environments that centralizes, simplifies, and automates the data encryption key management process to help minimize risk and reduce operational costs. SKLM - FoD offers a simple and robust solution for key storage, key serving, and key lifecycle management for self-encrypting drives (SEDs) in local and distributed System x environments. With the x3550 M5, the feature on demand (FoD) upgrade can be configured with the ServeRAID M5210 and M1215 RAID controllers paired with SEDs. The following table lists SKLM-FoD part numbers.

Table 23. Security Key Lifecycle Manager part numbers

Part number	Feature code	Description	Maximum supported
United States, Canada, Asia Pacific and Japan			
00D9998	A5U1	IBM SKLM for System x w/SEDs - FoD per Install w/1Yr S&S	1
00D9999	AS6C	IBM SKLM for System x w/SEDs - FoD per Install w/3Yr S&S	1
Latin America, Europe, Middle East and Africa			
00FP648	A5U1	IBM SKLM for System x w/SEDs - FoD per Install w/1Yr S&S	1
00FP649	AS6C	IBM SKLM for System x w/SEDs - FoD per Install w/3Yr S&S	1

Supported operating systems

The server supports the following operating systems:

- Microsoft:
    - Microsoft Windows Server 2012 R2
    - Microsoft Windows Server 2012
    - Microsoft Windows Server 2008 R2

- Red Hat:
    - Red Hat Enterprise Linux 7
    - Red Hat Enterprise Linux 6 Server x64 Edition (Update 5)

- SUSE:
    - SUSE LINUX Enterprise Server 11 for AMD64/EM64T (SP3)
    - SUSE LINUX Enterprise Server 11 with Xen for AMD64/EM64T (SP3)

- VMware:
    - VMware vSphere 5.5 (ESXi) (planned for later in 2014)
    - VMware vSphere 5.1 (ESXi) (Update 2)

See the ServerProven® website for the latest information about the specific versions and service levels supported and any other prerequisites:
http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/nos/matrix.shtml

Physical and electrical specifications

Dimensions and weight (approximate):

- Height: 43 mm (1.7 in)
- Width: 429 mm (16.9 in)
- Depth: 734 mm (28.9 in)
- Weight:
    - Minimum configuration: 13.8 kg (30.5 lb)
    - Maximum configuration: 19.3 kg (42.7 lb)

Supported environment:

- Air temperature:
    - Server on: 5 °C to 40 °C (41 °F to 104 °F); altitude: 0 to 950 m (3,117 ft); decrease the maximum system temperature by 1 °C for every 175-m increase in altitude above 950 m.
    - Server off: 5 °C to 45 °C (41 °F to 113 °F)
    - Maximum altitude: 3,050 m (10,000 ft), 5 °C to 28 °C (41 °F to 82 °F)
    - Shipment: -40 °C to +60 °C (-40 °F to 140 °F) at up to 10,700 m (35,105 ft)

- Humidity:
    - Server on: 8% to 85%, maximum dew point 24 °C, maximum rate of change 5 °C/hr
    - Server off: 8% to 85%, maximum dew point 27 °C

- Design to ASHRAE Class A3, ambient of 40 °C (104 °F), with relaxed support:

  - Supports cloud-like workload with no performance degradation acceptable (Turbo-Off).
  - Under no circumstance can any combination of worst case workload and configuration result in system shutdown or design exposure at 40 °C.

- Electrical:

  - Models with 900 W power supplies:

    - 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 10.3 A
    - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 5.0 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.14 kVA
      - Maximum configuration: 1.188 kVA

  - Models with 750 W power supplies:

    - 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 8.6 A (not supported by the 750 W Titanium power supply; it supports 200 - 240 V only)
    - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 4.2 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.14 kVA
      - Maximum configuration: 0.994 kVA

  - Models with 550 W power supplies:

    - 100 to 127 (nominal) V ac; 50 Hz or 60 Hz; 6.5 A
    - 200 to 240 (nominal) V ac; 50 Hz or 60 Hz; 3.3 A
    - Input kilovolt-amperes (kVA) (approximately):
      - Minimum configuration: 0.14 kVA
      - Maximum configuration: 0.725 kVA

- BTU output:

  - Minimum configuration: 461 Btu/hr (135 watts)
  - Maximum configuration: 4043 Btu/hr (1185 watts)

- Noise level:

  - 6.6 bels (operating)
  - 6.4 bels (idle)

Warranty options

The System x3550 M5 has a three-year onsite warranty with 9x5/next business day (NBD) terms. System x offers the warranty service upgrades through options, discussed in this section. The ServicePac is a series of prepackaged warranty maintenance upgrades and post-warranty maintenance agreements with a well-defined scope of services, including service hours, response time, term of service, and service agreement terms and conditions.

ServicePac offerings are country-specific, that is, each country might have its own service types, service levels, response times, and terms and conditions. Not all covered types of ServicePacs might be available in a particular country. For more information about ServicePac offerings available in your country, visit the ServicePac Product Selector at this website:

https://www-304.ibm.com/sales/gss/download/spst/servicepac

The following table explains warranty service definitions in more detail.

Table 24. Warranty service definitions

Term	Description
Onsite repair (IOR)	A service technician will come to the server's location for equipment repair.
24x7x2 hour	A service technician is scheduled to arrive at your client's location within two hours after remote problem determination is completed. We provide service around the clock, every day, including Lenovo holidays.
24x7x4 hour	A service technician is scheduled to arrive at your client's location within four hours after remote problem determination is completed. We provide service around the clock, every day, including Lenovo holidays.
9x5x4 hour	A service technician is scheduled to arrive at your client's location within four business hours after remote problem determination is completed. We provide service from 8:00 a.m. to 5:00 p.m. in the client's local time zone, Monday through Friday, excluding Lenovo holidays. If after 1:00 p.m., it is determined that onsite service is required, the client can expect the service technician to arrive the morning of the following business day. For noncritical service requests, a service technician will arrive by the end of the following business day.
9x5 next business day	A service technician is scheduled to arrive at your client's location on the business day after we receive your call, following remote problem determination. We provide service from 8:00 a.m. to 5:00 p.m. in the client's local time zone, Monday through Friday, excluding Lenovo holidays.

In general, the types of ServicePacs are listed:

- Warranty and maintenance service upgrades:
    - One, two, three, four, or five years of 9x5 or 24x7 service coverage
    - Onsite repair from next business day to 4 or 2 hours
    - One or two years of warranty extension
- Remote technical support services:
    - One or three years with 24x7 coverage (severity 1) or 9x5/next business day for all severities
    - Installation and startup support for System x servers
    - Remote technical support for System x servers
    - Software support - Support Line:
        - Microsoft or Linux software
        - VMware
        - IBM Systems Director

Regulatory compliance

The server conforms to the following regulations:

- FCC - Verified to comply with Part 15 of the FCC Rules, Class A
- Canada ICES-003, issue 5, Class A
- UL/IEC 60950-1
- CSA C22.2 No. 60950-1
- NOM-019
- Argentina IEC60950-1
- Japan VCCI, Class A
- Australia/New Zealand AS/NZS CISPR 22, Class A; AS/NZS 60950.1
- China CCC GB4943.1, GB9254 Class A, GB17625.1
- Taiwan BSMI CNS13438, Class A; CNS14336-1
- Korea KN22, Class A; KN24
- Russia, Belorussia and Kazakhstan, TR CU 020/2011 (for EMC) and TR CU 004/2011 (for safety)
- IEC 60950-1 (CB Certificate and CB Test Report)
- CE Mark (EN55022 Class A, EN60950-1, EN55024, EN61000-3-2, EN61000-3-3)
- CISPR 22, Class A
- TUV-GS (EN60950-1/IEC60950-1,EK1-ITB2000)

External disk storage expansion

The server supports attachment to external storage expansion enclosures, such as the EXP2500 series, by using the ServeRAID M5225 SAS/SATA Controller. The server can also be attached to supported external storage systems, such as the IBM Storwize V3700, using the supported HBAs. The following table shows the RAID controllers and options.

Table 25. RAID controllers and options for external disk storage expansion

Part number	Feature code	Description	Maximum supported	Standard models where used
12 Gb RAID controllers				
00AE938	A5ND	ServeRAID M5225-2GB SAS/SATA Controller	4	-
Feature on Demand (FoD) upgrades for the M5225				
47C8706	A3Z5	ServeRAID M5200 Series RAID 6 Upgrade	1*	-
47C8710	A3Z7	ServeRAID M5200 Series Performance Accelerator	1*	-
47C8712	A3Z8	ServeRAID M5200 Series SSD Caching Enabler	1*	-

The ServeRAID M5225 SAS/SATA Controller has the following specifications:

- Eight external 12 Gbps SAS/SATA ports
- Supports 12, 6, and 3 Gbps SAS and 6 and 3 Gbps SATA data transfer rates
- Two external x4 mini-SAS HD connectors (SFF-8644)
- Supports 2 GB flash-backed cache (standard)
- Supports RAID levels 0, 1, 5, 10, and 50 (standard)
- Supports RAID 6 and 60 with the optional M5200 Series RAID 6 Upgrade
- Supports optional M5200 Series Performance Accelerator and SSD Caching upgrades
- PCIe x8 Gen 3 host interface
- Based on the LSI SAS3108 12 Gbps ROC controller
- Supports connectivity to the EXP2512 and EXP2524 storage expansion enclosures

The ServeRAID M5225 SAS/SATA Controller supports connectivity to the external expansion enclosures listed in the following table. Up to nine expansion enclosures can be daisy-chained per one M5225 external port. For better performance, distribute expansion enclosures evenly across both M5225 ports.

Table 26. External expansion enclosures

Part number	Description	Maximum quantity supported per one M5225
610012X	EXP2512 Storage Enclosure	17
610024X	EXP2524 Storage Enclosure	9

The external SAS cables listed in the following table support connectivity between external expansion enclosures and the ServeRAID M5225 SAS/SATA Controller.

Table 27. External SAS cables for external storage expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
Server to Expansion enclosure connectivity (Mini-SAS HD x4 to Mini-SAS x4)		
00MJ162	0.6m SAS Cable (mSAS HD to mSAS)	1
00MJ163	1.5m SAS Cable (mSAS HD to mSAS)	1
00MJ166	3m SAS Cable (mSAS HD to mSAS)	1
Expansion enclosure to Expansion enclosure connectivity (Mini-SAS x4 to Mini-SAS x4)		
39R6529	1 m SAS Cable	1
39R6531	3 m SAS Cable	1

The following table lists the drives supported by EXP2512 external expansion enclosures.

Table 28. Drive options for EXP2512 external expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
3.5" NL SAS HS HDDs		
00NC555	2TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12
00NC557	3TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12
00NC559	4TB 7,200 rpm 6Gb SAS NL 3.5" HDD	12

The following table lists the hard disk drives supported by EXP2524 external expansion enclosures.

Table 29. Drive options for EXP2524 external expansion enclosures

Part number	Description	Maximum quantity supported per one enclosure
2.5" NL SAS HS HDDs		
00NC571	1TB 7,200 rpm 6Gb SAS NL 2.5" HDD	24
2.5" SAS HS HDDs		
00NC561	146GB 15,000 rpm 6Gb SAS 2.5" HDD	24
00NC563	300GB 15,000 rpm 6Gb SAS 2.5" HDD	24
00NC565	600GB 10,000 rpm 6Gb SAS 2.5" HDD	24
00NC567	900GB 10,000 rpm 6Gb SAS 2.5" HDD	24
00NC569	1.2TB 10,000 rpm 6Gb SAS 2.5" HDD	24
2.5" SAS HS SSDs		
00NC573	200GB 6Gb SAS 2.5" SSD	24
00NC575	400GB 6Gb SAS 2.5" SSD	24

External disk storage systems

The following table lists the external storage systems that are supported by the server and that can be ordered through System x sales channel. The server might support other disk systems that are not listed in this table. Refer to the IBM System Storage Interoperation Center for further information: http://www.ibm.com/systems/support/storage/ssic

Table 30. External disk storage systems

Part number	Description
2071CU2	Storwize V3500 LFF Dual Control Enclosure
2071CU3	Storwize V3500 SFF Dual Control Enclosure
6099L2C	Storwize V3700 3.5-inch Storage Controller Unit
6099S2C	Storwize V3700 2.5-inch Storage Controller Unit
6099T2C	Storwize V3700 2.5-inch DC Storage Controller Unit

For more information, see the list of Product Guides in the System Storage category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=externalstorage

External backup units

The server supports the external backup attachment options listed in the following table.

Table 31. External backup options

Part number	Description
External tape expansion enclosures for internal tape drives	
87651UX	1U Tape Drive Enclosure
87651NX	1U Tape Drive Enclosure (with Nema 5-15P LineCord)
Tape enclosure adapters (with cables)	
44E8869	USB Enclosure Adapter Kit
Internal backup drives supported by external tape enclosures	
00D2786	RDX Internal USB 3.0 Dock with 320GB Cartridge
00D2787	RDX Internal USB 3.0 Dock with 500GB Cartridge
00D2788	RDX Internal USB 3.0 Dock with 1TB Cartridge
External backup units*	
362532Y	RDX External USB 3.0 Dock with 320GB Cartridge
362550Y	RDX External USB 3.0 Dock with 500GB Cartridge
36251TY	RDX External USB 3.0 Dock with 1TB Cartridge

* The external tape drives listed can be ordered through the System x sales channel. The server might support other tape drives that are not listed in this table. Refer to the IBM System Storage Interoperation Center for further information.

For more information, see the list of Product Guides in the Backup units category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=tape

Top-of-rack Ethernet switches

The server supports the top-of-rack Ethernet switches listed in the following table.

Table 32. Top-of-rack switches

Part number	Description
1 Gb top-of-rack switches	
7309BAX	RackSwitch™ G7028
7309CAX	RackSwitch G7052
0446013	RackSwitch G8000R
7309CFC	RackSwitch G8000F
7309G52	RackSwitch G8052R
730952F	RackSwitch G8052F
10 Gb top-of-rack switches	
7309DRX	RackSwitch G8264CS (Rear to Front)
7309DFX	RackSwitch G8264CS (Front to Rear)
7309BR6	RackSwitch G8124ER
7309BF7	RackSwitch G8124EF
7309G64	RackSwitch G8264R
730964F	RackSwitch G8264F
7309CR9	RackSwitch G8264TR
7309CF9	RackSwitch G8264TF
40 Gb top-of-rack switches	
8036BRX	RackSwitch G8332 (Rear to Front)
8036BFX	RackSwitch G8332 (Front to Rear)
8036ARX	RackSwitch G8316R
8036AFX	RackSwitch G8316F

For more information, see the list of Product Guides in the Top-of-rack switches category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=tor

Uninterruptible power supply units

The server supports attachments to the uninterruptible power supply (UPS) units listed in the following table.

Table 33. Uninterruptible power supply units

Part number	Description
Rack-mounted or tower UPS units	
55941AX	RT1.5kVA 2U Rack or Tower UPS (100-125VAC)
55941KX	RT1.5kVA 2U Rack or Tower UPS (200-240VAC)
55942AX	RT2.2kVA 2U Rack or Tower UPS (100-125VAC)
55942KX	RT2.2kVA 2U Rack or Tower UPS (200-240VAC)
55943AX	RT3kVA 2U Rack or Tower UPS (100-125VAC)
55943KX	RT3kVA 2U Rack or Tower UPS (200-240VAC)
55945KX	RT5kVA 3U Rack or Tower UPS (200-240VAC)
55946KX	RT6kVA 3U Rack or Tower UPS (200-240VAC)
55948KX	RT8kVA 6U Rack or Tower UPS (200-240VAC)
55949KX	RT11kVA 6U Rack or Tower UPS (200-240VAC)
55948PX	RT8kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)
55949PX	RT11kVA 6U 3:1 Phase Rack or Tower UPS (380-415VAC)
Rack-mounted UPS units	
53951AX	1500VA LCD 2U Rack UPS (100V/120V)
53951KX	1500VA LCD 2U Rack UPS (230V)
53952AX	2200VA LCD 2U Rack UPS (100V/120V)
53952KX	2200VA LCD 2U Rack UPS (230V)
53953AX	3000VA LCD 3U Rack UPS (100 V/120 V)
53953JX	3000VA LCD 3U Rack UPS (200 V/208 V)
53956AX	6000VA LCD 4U Rack UPS (200 V/208 V)
53956KX	6000VA LCD 4U Rack UPS (230 V)
53959KX	11000VA LCD 5U Rack UPS (200V/208V/230V)

For more information, see the list of Product Guides in the Power infrastructure category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=power

Power distribution units

The server supports attachments to the power distribution units (PDUs) listed in the following table.

Table 34. Power distribution units (part 1)

Part number	Description
Switched and Monitored PDUs	
46M4002	1U 9 C19/3 C13 Active Energy Manager DPI PDU
46M4003	1U 9 C19/3 C13 Active Energy Manager 60A 3 Phase PDU
46M4004	1U 12 C13 Active Energy Manager DPI PDU
46M4005	1U 12 C13 Active Energy Manager 60A 3 Phase PDU
46M4167	1U 9 C19/3 C13 Switched and Monitored 30A 3 Phase PDU
46M4116	0U 24 C13 Switched and Monitored 30A PDU
46M4119	0U 24 C13 Switched and Monitored 32A PDU
46M4134	0U 12 C19/12 C13 Switched and Monitored 50A 3 Phase PDU
46M4137	0U 12 C19/12 C13 Switched and Monitored 32A 3 Phase PDU
Enterprise PDUs	
71762MX	Ultra Density Enterprise PDU C19 PDU+ (WW)
71762NX	Ultra Density Enterprise PDU C19 PDU (WW)
71763MU	Ultra Density Enterprise PDU C19 3 Phase 60A PDU+ (NA)
71763NU	Ultra Density Enterprise PDU C19 3 Phase 60A PDU (NA)
39M2816	DPI C13 Enterprise PDU without linecord
39Y8923	DPI 60A Three Phase C19 Enterprise PDU with IEC309 3P+G (208 V) fixed line cord
39Y8941	DPI Single Phase C13 Enterprise PDU without line cord
39Y8948	DPI Single Phase C19 Enterprise PDU without line cord
Front-end PDUs	
39Y8934	DPI 32 amp/250 V Front-end PDU with IEC 309 2P+Gnd connector
39Y8935	DPI 63amp/250 V Front-end PDU with IEC 309 2P+Gnd connector
39Y8938	30 amp/125 V Front-end PDU with NEMA L5-30P connector
39Y8939	30 amp/250 V Front-end PDU with NEMA L6-30P connector
39Y8940	60 amp/250 V Front-end PDU with IEC 309 60A 2P+N+Gnd connector

Table 34. Power distribution units (part 2)

Part number	Description
Universal PDUs	
39Y8951	DPI Universal Rack PDU with US LV and HV line cords
39Y8952	DPI Universal Rack PDU with CEE7-VII Europe LC
39Y8953	DPI Universal Rack PDU with Denmark LC
39Y8954	DPI Universal Rack PDU with Israel LC
39Y8955	DPI Universal Rack PDU with Italy LC
39Y8956	DPI Universal Rack PDU with South Africa LC
39Y8957	DPI Universal Rack PDU with UK LC
39Y8958	DPI Universal Rack PDU with AS/NZ LC
39Y8959	DPI Universal Rack PDU with China LC
39Y8962	DPI Universal Rack PDU (Argentina)
39Y8960	DPI Universal Rack PDU (Brazil)
39Y8961	DPI Universal Rack PDU (India)
0U Basic PDUs	
46M4122	0U 24 C13 16A 3 Phase PDU
46M4125	0U 24 C13 30A 3 Phase PDU
46M4128	0U 24 C13 30A PDU
46M4131	0U 24 C13 32A PDU
46M4140	0U 12 C19/12 C13 60A 3 Phase PDU
46M4143	0U 12 C19/12 C13 32A 3 Phase PDU

For more information, see the list of Product Guides in the Power infrastructure category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=power

Rack cabinets

The server supports the rack cabinets listed in the following table.

Table 35. Rack cabinets

Part number	Description
201886X	11U Office Enablement Kit
93072RX	25U Standard Rack
93072PX	25U Static S2 Standard Rack
93634EX	42U 1100mm Dynamic Expansion Rack
93634PX	42U 1100mm Dynamic Rack
93604EX	42U 1200mm Deep Dynamic Expansion Rack
93604PX	42U 1200mm Deep Dynamic Rack
93614EX	42U 1200mm Deep Static Expansion Rack
93614PX	42U 1200mm Deep Static Rack
93084EX	42U Enterprise Expansion Rack
93084PX	42U Enterprise Rack
93074RX	42U Standard Rack
93074XX	42U Standard Rack Extension
93624EX	47U 1200mm Deep Static Expansion Rack
93624PX	47U 1200mm Deep Static Rack
93634BX	PureFlex® System 42U Expansion Rack
93634DX	PureFlex System 42U Expansion Rack
93634AX	PureFlex System 42U Rack
93634CX	PureFlex System 42U Rack

For more information, see the list of Product Guides in the Rack cabinets and options category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=rack

Rack options

The server supports the rack options listed in the following table.

Table 36. Rack options

Part number	Feature code	Description
Miscellaneous options for the x3550 M5		
00KA606	A5AK	System x3550 M5 Slide Kit G4 (included with the server)
00KA607	A5AL	System x Enterprise 1U Cable Management Arm (CMA)
00KA500	A5FW	System x Gen-II Universal Slides Kit
00KA162	A5AP	Lockable Front Bezel
Monitor kits and keyboard trays		
17238BX	1723HC1 fc A3EK	1U 18.5" Standard Console
17238EX	1723HC1 fc A3EL	1U 18.5" Enhanced Media Console
Console switches		
1754D2X	1754HC2 fc 6695	Global 4x2x32 Console Manager (GCM32)
1754D1X	1754HC1 fc 6694	Global 2x2x16 Console Manager (GCM16)
1754A2X	1754HC4 fc 0726	Local 2x16 Console Manager (LCM16)
1754A1X	1754HC3 fc 0725	Local 1x8 Console Manager (LCM8)
Console cables		
43V6147	3757	Single Cable USB Conversion Option (UCO)
39M2895	3756	USB Conversion Option (4 Pack UCO)
46M5383	5341	Virtual Media Conversion Option Gen2 (VCO2)
46M5382	5340	Serial Conversion Option (SCO)
Universal management gateway and cables		
3858D3X	3858HC1 fc A4X1	Avocent Universal Management Gateway 6000
00AK142	A4X4	UM KVM Module VGA+SD Dual RJ45

For more information, see the list of Product Guides in the Rack cabinets and options category:
http://www.redbooks.ibm.com/portals/systemx?Open&page=pg&cat=rack

Related publications and links

For more information, see these resources:

- System x3550 M5 product page
  http://www.ibm.com/systems/x/hardware/rack/x3550m5/index.html

- System x3550 M5 Installation and Service Guide
  http://ibm.com/support/entry/portal/docdisplay?lndocid=MIGR-5096267

- US Announcement Letter - September 9, 2014
  http://ibm.com/common/ssi/cgi-bin/ssialias?infotype=dd&subtype=ca&&htmlfid=897/ENUS114-141

- ServerProven hardware compatibility page for the x3550 M5
  http://www.ibm.com/systems/info/x86servers/serverproven/compat/us/xseries/5463.html

- Product Guides for System x servers and options
  http://www.redbooks.ibm.com/portals/systemx?Open&page=pgbycat

- Configuration and Option Guide
  http://www.ibm.com/systems/xbc/cog/

- xRef - System x Reference Sheets
  http://www.redbooks.ibm.com/xref

- System x Support Portal
  http://ibm.com/support/entry/portal/
  http://ibm.com/support/entry/portal/Downloads/Hardware/Systems/System_x/System_x3550_M5

- System Storage Interoperation Center
  http://www.ibm.com/systems/support/storage/ssic

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